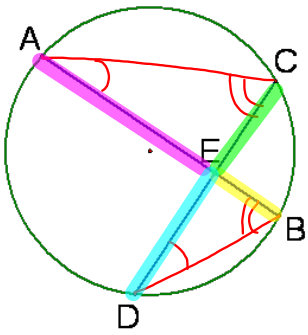
10-7 Notes-Special Segments in a Circle



$\angle A \cong \angle$ D

$\angle C \cong \angle$ B

$\therefore \Delta AEC \sim \Delta$ DEB

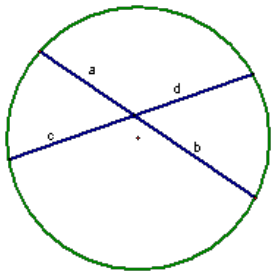
Why? AA~

$\frac{AE}{DE} = \frac{EC}{EB}$

$\therefore$ AE · EB = EC · DE

Theorem 10.15-If 2 chords intersect in a circle, then the products of the measures of the segments of the chords are equal.

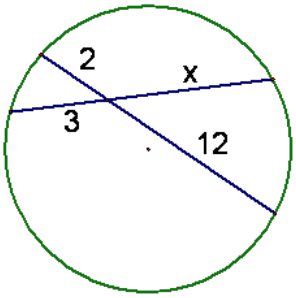
$a \cdot b = c \cdot d$

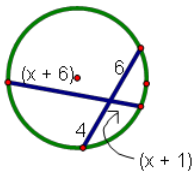


$3x = 2 \cdot 12$

$3x = 24$

$x = 8$





$4 \cdot 6 = (x+6)(x+1)$

$24 = x^2 + 6x + 1x + 6$

$24 = x^2 + 7x + 6$

$0 = x^2 + 7x - 18$

$0 = (x+9)(x-2)$

$x = -9$ $x = 2$

-18

$9 \quad -2$

7

$\angle A \cong \angle$ C

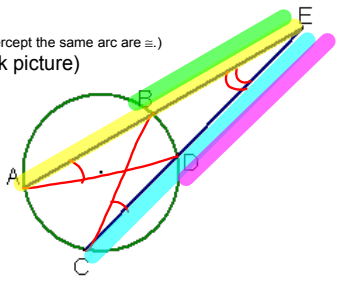
$\angle E \cong \angle$ E (Inscribed $\angle$s that intercept the same arc are $\cong$.)

(reflexive) (mark picture)

$\therefore \Delta AED \sim \Delta$ CEB

Why? AA~

$\frac{AE}{CE} = \frac{ED}{EB}$

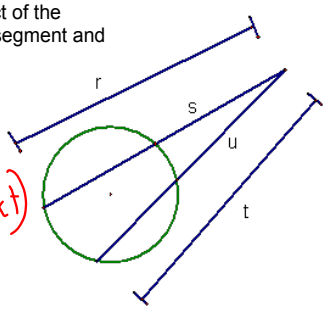


$\therefore$ AE · EB = ED · CE

Theorem 10.16-If two secant segments are drawn to a circle from an exterior point, then the product of the measures of one secant segment and its external secant segment is equal to the product of the measures of the other secant segment and its external secant segment.

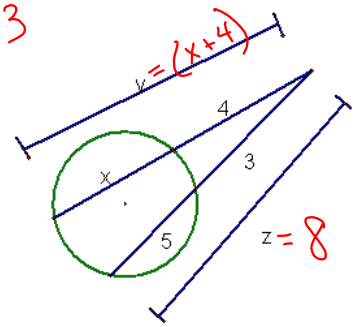
$r \cdot s = t \cdot u$

(whole)(ext) = (whole)(ext)



$(x+4)4 = 8 \cdot 3$

$x = 2$



Connect A & D to form ΔACD.

Connect B & D to form ΔBDC.

∠A intercepts what arc? $\overset{\frown}{BD}$

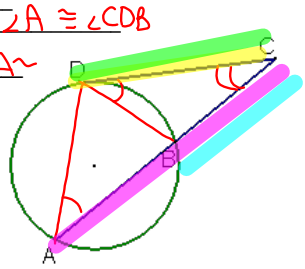
∠CDB intercepts what arc? $\overset{\frown}{BD}$

What conclusion can you make? $\angle A \cong \angle CDB$

(mark picture)

∴ΔACD ~ Δ DCB Why? AA~

(Hint: reflexive ∠C.)

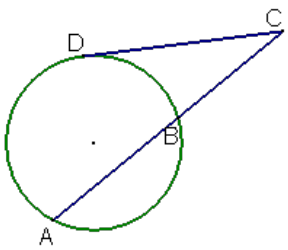


$\frac{AC}{DC} = \frac{CD}{CB}$

∴ AC·CB = CD·DC

Theorem 10.17-If a tangent segment and a secant segment are drawn to a circle from an exterior point, then the (measure of the tangent segment)^2 = the product of the measures of the secant segment and its external secant segment

$CD^2 = AC \cdot BC$



$(2x+2)x = (x+4)^2$

$2x^2+2x = (x+4)(x+4)$

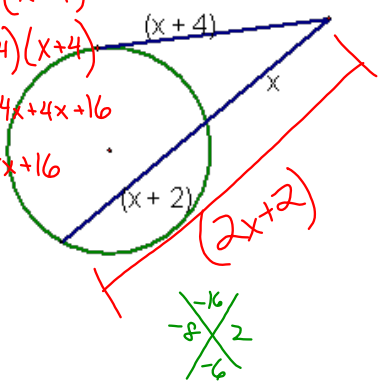
$x^2+4x+4x+16$

$2x^2+2x = x^2+8x+16$

$x^2-6x-16=0$

$(x-8)(x+2)$

$x = 8, x \neq -2$



-16, -8, 2, -6

$x^2 = 24 \cdot 6$

144

$x = 12$